

Rock Island Arsenal
Reservoir
(Building 53)
Fifty Yards North of the Midpoint
of North Avenue
Rock Island
Rock Island County
Illinois

HAER No. IL-20-M

HAER
ILL,
81-ROCIL,
3/53-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
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3/53-

HISTORIC AMERICAN ENGINEERING RECORD

ROCK ISLAND ARSENAL
RESERVOIR
(Building 53)
HAER No. IL-20M

Location: Fifty Yards North of the Midpoint of North Avenue,
Rock Island Arsenal,
Rock Island,
Rock Island County, Illinois
UTM: 15.704900.4598180
Quad: Davenport East

Date of Construction: 1868

Present Owner and Occupant: U.S. Army

Present Use: Inactive

Significance: After taking command of Rock Island Arsenal in 1865, General Thomas Jefferson Rodman devised a master plan for the installation calling for the construction of ten large manufacturing shops, five on each side of the island's major east-west thoroughfare. These manufacturing structures were supplemented by a variety of administrative, residential, maintenance, storage, and utility buildings.

Forming a cohesive architectural statement that is unique among Midwest government installations, the Rodman plan buildings are the administrative and technological core of Rock Island Arsenal, one of only two "old-line, nineteenth-century arsenals still in operation for munitions production. The buildings are vital for understanding the history of American ordnance development and manufacture from the Spanish American War to the present.

Located just north of the central manufacturing shops, the Reservoir was the first permanent building erected under the Rodman plan. Designed by Rodman, it was completed in 1869 and remained in use for over a century, distributing water through an underground pipe system to administrative, manufacturing, and residential struc-

ROCK ISLAND ARSENAL
RESERVOIR
(Building 53)
HAER No. IL-20M (Page 2)

tures. The Reservoir is part of the Rock
Island Arsenal National Register Historic
District.

Historian:

Jeffrey A. Hess, February 1985

Architectural Historian:

David Arbogast, February 1985

PART 1. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: According to Colonel Daniel Webster Flagler, who succeeded General Thomas Jefferson Rodman as the arsenal's commandant in 1871, construction began in June 1868 and was completed in December of that same year (Flagler, p. 253).
2. Architect: General Thomas Jefferson Rodman (Flagler, pp. 252-253, 259). Rodman submitted plans for the Reservoir to the War Department in Washington in February 1869, and they were approved two months later (Flagler, pp. 252-253).

Born in Salem, Indiana in 1815, Rodman graduated from West Point in 1841 and was assigned to Allegheney Arsenal in Pittsburgh as an officer of the Ordnance Department. During the next two decades, he developed techniques for hollow casting cannon and for producing perforated propellant, which revolutionized the manufacture and use of artillery (Zabecki, pp. 55-56; Flagler, pp. 262-266).

As commandant of Watertown Arsenal near Boston from 1859 to 1865, Rodman was responsible for designing that installation's commanding officer's quarters, which was a simplified, brick version of the Italianate stone structure he subsequently planned for Rock Island Arsenal (Baylies and Bahr, p. 37). Rodman assumed command of Rock Island Arsenal in 1865 and died of illness at the installation in June 1871 (Flagler, pp. 116, 261).

3. Original and subsequent owners: U.S. Army.
4. Builder, contractor, suppliers: Construction was done by day workmen, employed and paid by the Government. The work was directed and superintended directly by officers of the Ordnance Department stationed at the arsenal, and the necessary engineering work, calculations, making of tests, experiments, etc., was also done by the officers (Flagler, p. 260). The project was the immediate responsibility of Captain F. H. Parker (Flagler, p. 254).

Foundation stone was quarried on the island. The building stone was supplied on a contract basis by "Messrs. Sanger & Steele, of Joliet, Ill., from their limestone quarries on the Illinois and Michigan Canal, about two miles north of Joliet. The price paid was \$6 per cubic yard, delivered at the quarries and measured in

the walls of the [building], excluding all openings and builder's or constructive measurements. The cost of transportation to the arsenal was about \$5.50 per yard" (Flagler, pp. 258, 256).

Cement mortar was furnished on a contract basis by "Messrs. James Clark & Sons of Utica, Ill., at \$1.55 per barrel of 300 pounds delivered at the arsenal. The lime was purchased from W. B. Barnes, of Rock Island, Ill., at 90 cents per barrel of 200 pounds delivered at the arsenal" (Flagler, pp. 257, 254).

5. Original plans and construction: No original plans or drawings have been located. In a letter to the War Department, Rodman described his original plans for the building: "Inclosed herewith I send drawings of proposed stone reservoir, and plans showing proposed site thereof. Reflection upon the subject has led me to the conclusion that it will be more economical and better to build one large reservoir with a partition in it . . . than to build two or more separate reservoirs at different points. The twenty-five feet above ground will give head enough to carry water into second story of shops and all other buildings now contemplated to be built here, and the 4 feet below may be used for sluicing out sewers, or be drawn out by fire engine in case of fire. The partition will enable us to clean out or repair one half while using the other. The site selected and shown on plan is central, and I think the most eligible that can be had" (Flagler, p. 253).

Flagler described the original construction as follows: "The total cost of the reservoir was \$30,427, and in this was included the necessary pipes, water gates, a boiler house, boiler, and connecting pipes. As completed, the reservoir was . . . circular in form; interior diameter, 80 feet; height of wall from floor of reservoir, 32 feet 8 inches; thickness of wall at floor line, 8 feet; at top, 2 feet ten inches. It was covered with a coping 10 inches thick, projecting 5 inches. The wall was further strengthened with buttresses placed 15 feet apart, 2 feet wide, projecting 3 feet from the face of the wall at the bottom, and battering to the face line of the wall at the top. The exterior of the wall is heavy ashler limestone, laid in courses of from 10 inches to 20 inches thick, backed on the interior by rubble, also laid in courses. The interior division wall is 11 feet 5 inches high. Outside the reservoir on the south side is a stone boiler house, provided with a water boiler and circulating water pipes communicating with the interior of the reservoir. The object of this arrangement was, by heating the water, to prevent the formation of ice in the reservoir and injury therefrom to the walls The reservoir is provided with receiving and

ROCK ISLAND ARSENAL
RESERVOIR
(Building 53)
HAER No. IL-20M (Page 5)

discharge pipes to each interior compartment, and the latter have each two branches, one to the service mains and one to a waste pipe. The diameter of all these pipes is 8 inches. The total capacity of the reservoir was 1,200,000 gallons, but it was thought that the walls were not sufficiently strong to bear the pressure, and the overflow pipe was placed 7 feet below the top of the wall, which reduced the capacity to about 928,000 gallons" (Flagler, p. 254).

Flagler's description is substantiated by a photograph (see HAER Photo No. IL-20M-3) in the picture collection of the Rock Island Arsenal Historical Office. The photograph is captioned on the back "From Stereo Card . . . Ca. 1873, looking N." It shows the building in its present configuration, except that the original coping has been replaced by a conical roof. The roof is documented in a photograph published in 1887 (First Album, n.p.), and reproduced in the picture collection of the Rock Island Arsenal Historical Office (see HAER Photo No. IL-20M-4).

6. Alterations and additions: In 1874-1875, the original coping was replaced with a wood-frame, conical roof and the reservoir's interior was waterproofed with a brick lining plastered with Portland cement (Flagler, pp. 254, 344). An architectural drawing for this remodeling, showing an elevation, a cross section, and two plan views, is in the Rock Island Arsenal Engineering Plans and Services Division (see HAER Photo No. IL-20M-5). The drawing bears the following description: "Reservoir / Building No. 53 / Original Title 'Plan of Reservoir Showing Roof and Alterations Made December 1874' / Oct. 1, 1935 / Process Tracing Made from Original Cardboard Drawing Signed W. D. Flagler . . . Feb. 1875."

In July 1958, a one-inch coating of Gunitite was applied to the structure's exterior, and a two-and-one-half-inch coating to the interior, for waterproofing purposes. The work was done by Bolton Gunitite Company of Chicago for a cost of \$30,510 (Office Memorandum). A photograph in the Rock Island Arsenal Browning Museum documents the completion of the waterproofing project. It is captioned on the front, "Rock Island Arsenal Ordnance Corps / 27-61297 July 28, 1958 / Building Nr. 53, Reservoir, Gunitite in Place on Exterior Wall / Looking South."

B. Historical Context:

Located just north of the central manufacturing area, the Reservoir was the first building erected at the arsenal under the Rodman plan. Construction began in June 1869 and was completed in December of that

same year. Designed by Rodman, the building distributed water by means of an underground pipe system to the arsenal's major manufacturing, administrative, and residential structures. Currently inactive, it remained in use for over a century. (For additional documentation, see HAER No. IL-20.)

Prepared by: Jeffrey A. Hess
MacDonald and Mack Partnership
February 1985

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural character: The reservoir is a massive, round, astylar, limestone building with a small rectangular addition on its south side. It is one story without basement or attic.
2. Condition of fabric: The building has been abandoned and is in increasingly deteriorated condition with loss of significant portions of the Gunite facing and spalling of the limestone.

B. Description of Exterior:

1. Overall dimensions: The building measures 97' in diameter at its base and is one story tall without basement or attic.
2. Foundations: Coursed, rock-faced ashlar limestone.
3. Walls: Coursed, rock-faced ashlar limestone covered with a thick coating of Gunite (HAER Photo Nos. IL-20M-1 and IL-20M-2), which is cracked and spalling. The walls are 8' thick at their base and taper to 2'-10" at the top. A set of twenty 2' wide ashlar limestone buttresses (HAER Photo No. IL-20M-1) are evenly spaced around the perimeter and taper upward to the top of the walls. Between the two north buttresses the limestone wall is exceptionally thick. The extension (HAER Photo No. IL-20M-2) has limestone walls set into the berm surrounding the base of the reservoir.
4. Structural systems: Limestone bearing walls. The roof system is inaccessible, but probably timber trusses as shown on drawings.
5. Openings:
 - a. Doorways: There is one doorway (HAER Photo No. IL-20M-2) in the south face of the south extension. It has a simple, rectangular opening containing a plain, vertical board door with a plain, wood frame.

ROCK ISLAND ARSENAL
RESERVOIR
(Building 53)
HAER No. IL-20M (Page 7)

b. Windows: None.

6. Roof:

- a. Shape, covering: The main roof (HAER Photo No. IL-20M-1) is conical and is covered with asphalt shingles. The extension roof is flat and is covered by the berm (HAER Photo Nos. IL-20M-1 and IL-20M-2) surrounding the reservoir.
- b. Cornice, eaves: The minimal cornice and eaves (HAER Photo No. IL-20M-1) are free of any gutter or leader system.
- c. Cupolas: In the center of the roof is an octagonal wood cupola (HAER Photo No. IL-20M-1) with louvered wood vents in each of its sides and a bellcast roof with projecting wood eaves and a (now-missing) wood finial. On the east, west, and south slopes of the roof are single, rectangular, wood ventilators (HAER Photo No. IL-20M-1) having louvered wood vents in each face and flat, asphalt-shingled roofs.
- d. Stairways: There is a steel ladder in a round steel cage on the east wall.

C. Description of Interior: Access to the interior is through the roof only. Therefore, the following comments are based on information derived from drawings and not from site conditions.

- 1. Floor plans: The interior is divided in half by a limestone wall with two pairs of buttresses. The wall rises only halfway up the interior before stopping. The room in the south extension allows no access into the interior.
- 2. Flooring: Probably none. One of the primary reasons the reservoir was abandoned was the extreme water loss through the ground.
- 3. Wall and ceiling finishes: Probably unpainted limestone walls and unfinished wood roof decking.
- 4. Mechanical equipment: It is highly unlikely that any portions of the original hydraulic equipment system survive.

D. Site:

- 1. General setting and orientation: The reservoir is set on a raised berm within a fenced enclosure north of North Avenue. Directly to its north is Structure 57, a stone bridge and a golf course. Between it and North Avenue lies Building 54, a fuel oil house building. To the west are Buildings 50 and 52, a filter plant and a

material stores building, respectively. The site slopes gently to the north.

Prepared by: David Arbogast
Architectural Conservator
February 1985

PART III. SOURCES OF INFORMATION

A. Original Architectural Drawings:

The Rock Island Arsenal Engineering Plans and Services Division has an architectural drawing for the Reservoir's waterproofing and roof construction in 1874-1875. Containing an elevation, a cross section, and two plan views, the drawing bears the following description: "Reservoir / Building No. 53 / Original Title 'Plan of Reservoir Showing Roof and Alterations Made December 1874' / Oct. 1, 1935 / Process Tracing Made from Original Cardboard Drawing Signed W. D. Flagler . . . Feb. 1875" (see HAER Photo No. IL-20M-5).

B. Early Views:

An early photograph (see HAER Photo No. IL-20M-3) in the picture collection of the Rock Island Arsenal Historical Office shows the building a few years after its completion with the original coping in place. It is captioned on the back: "From Stereo Card . . . ca. 1873, looking N." The same collection contains an early photograph (see HAER Photo No. IL-20M-4), originally published in 1887 (First Album, n.p.), that shows the Reservoir after the addition of the conical roof. It is captioned on the front, "Water Reservoir."

C. Bibliography:

1. Primary and unpublished sources:

Baylies, Libby and Bahr, Betsy. "Historic American Buildings Survey of the United States Materials and Mechanics Research Center, Watertown, Massachusetts." 1982. HAER No. MA-20, HABS/HAER Collection, Prints and Photographs Division, Library of Congress. Discusses Rodman's architectural work at Watertown Arsenal.

Hess, Jeffrey A., and Mack, Robert C. "Historic Properties Report Rock Island Arsenal, Rock Island, Illinois". Prepared by MacDonald and Mack Partnership, and Building Technology Incorporated for the Historic American Buildings Survey/Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1985. The report,

with accompanying inventory cards, is filed as field records in the Prints and Photographs Division, Library of Congress, under HAER No. IL-20.

Office Memorandum to Public Information Office from Plant Facilities, January 7, 1959. Describes waterproofing of the building with Gunitite.

Real Property Cards, Engineering Plans and Services Division, Rock Island Arsenal. Briefly describes building's structural characteristics and provides sketchy history of maintenance operations.

2. Secondary and published sources:

First Album of the City of Davenport, Ia. Davenport: Huebinger's Photographic Art Gallery, 1887. Rock Island Arsenal Historical Office. Reproduces an early photograph of building, showing addition of conical roof.

Flagler, D[aniel] W[ebster]. A History of the Rock Island Arsenal from Its Establishment in 1863 to December 1876. Washington, D.C.: Government Printing Office, 1877. The most detailed account of the building's construction, written by the arsenal's commandant from 1871 to 1886.

Nothstein, Ira O. and Stephens, Clifford W. A History of Rock Island Arsenal from Earliest Times to 1954. Rock Island: U.S. Army, Rock Island Arsenal, 1965. 3 vols. Rock Island Arsenal. The best account of the arsenal's general operations.

Zabecki, David T. "Father of the Rock Island Arsenal." Field Artillery Journal, 49 (January / February, 1951), 55-56. Discusses Rodman's pioneering work in cannon and propellant design.

D. Likely Sources Not Yet Investigated:

Record Group 156 at the National Archives contains correspondence on the construction and operation of Rock Island Arsenal from 1871 to 1903. This material is also available on 216 reels of microfilm at the Browning Museum, Rock Island Arsenal.

PART IV. PROJECT INFORMATION

This project was part of a program initiated through a memorandum of agreement between the National Park Service and the U.S. Department of the Army.

ROCK ISLAND ARSENAL
RESERVOIR
(Building 53)
HAER No. IL-20M (Page 10)

Stanley J. Fried, Chief, Real Estate Branch of Headquarters DARCOM, and Dr. Robert J. Kapsch, Chief of the Historic American Buildings Survey/Historic American Engineering Record, were program directors. Sally Kress Tompkins of HABS/HAER was program manager, and Robie S. Lange of HABS/HAER was project manager. Building Technology Incorporated, Silver Spring, Maryland, under the direction of William A. Brenner, acted as primary contractor, and MacDonald and Mack Partnership, Minneapolis, was a major subcontractor. The project included a survey of historic properties at Rock Island Arsenal, as well as preparation of an historic properties report and HABS/HAER documentation for 38 buildings. The survey, report, and documentation were completed by Jeffrey A. Hess, historian, Minneapolis; Barbara E. Hightower, historian, Minneapolis; David Arbogast, architectural historian, Iowa City, Iowa; and Robert C. Mack, architect, Minneapolis. The photographs were taken by Robert A. Ryan, J Ceronie, and Bruce A. Harms of Dennett, Muessig, Ryan, and Associates, Ltd., Iowa City, Iowa. Drawings were produced by John Palmer Low, Minneapolis.